ASIAN DIGITAL GOVERNANCE PROBLEMS

e-ISSN 3048-086 (online)

Volume 2, Issue 2 2025
Page 145-162

https://doi.org/10.71435/685960

Evaluation of Digital Governance Implementation in the Public Sector: A Study of the Effectiveness of the Smart Governance Program

Muhammad Fadli Akbar[1]

[1]Public Administration Study Program, Universitas Dipa Makassar, Indonesia

ARTICLE INFO

Received: 20 August 2025
Revised: 26 October 2025
Accepted: 06 December 2025
Available online: 12 December 2025

Keywords:
Smart Governance
Digital Governance
Public Service Effectiveness
Transparency
Citizen Participation

Corresponding Author:
Muhammad Fadli Akbar

Email:
muhammadfadliakbar@gmail.com

ABSTRACT

***Purpose**: This study aims to evaluate the implementation and effectiveness of the Smart Governance Program in Makassar City, Indonesia, particularly in improving public service effectiveness through transparency, responsiveness, and digital accessibility.*

***Subjects and Methods:** The study employed a quantitative descriptive-explanatory design involving 200 respondents consisting of government employees and citizens interacting with digital public services. Data were collected through structured questionnaires and analyzed using descriptive statistics, Pearson correlation, and multiple linear regression analysis with SPSS.*

***Results:** The findings revealed that transparency, responsiveness, and digital accessibility positively and significantly influenced public service effectiveness. Transparency emerged as the strongest predictor, indicating that open administrative systems and accessible information substantially improve citizen trust and governance performance. Digital governance also improved efficiency, accountability, and service responsiveness, although challenges related to accessibility disparities and institutional coordination persisted.*

***Conclusions:** The study concludes that successful smart governance depends not only on technological infrastructure but also on institutional readiness, organizational coordination, and citizen-centered governance practices that strengthen public trust and administrative effectiveness in urban governance transformation.*

INTRODUCTION

In the twenty-first century, governance has entered an era defined not only by administrative reform but by digital transformation (Jia & Chen, 2022; Gebrihet & Pillay, 2021; Cioffi et al., 2022). Governments around the world are reimagining their roles and responsibilities in response to the accelerating influence of information technology on social, economic, and political life. Digital governance, often associated with the broader discourse of smart government or smart city, represents an institutional shift toward data-driven decision-making, online service delivery, and interactive citizen engagement. Yet, beyond its technological sophistication, digital governance is essentially a reconfiguration of power, transparency, and accountability.

It redefines how authority is exercised and how citizens perceive their relationship with the state. In this new terrain, the challenge for governments is not simply to digitize existing procedures

but to transform the very logic of administration into one that is adaptive, participatory, and responsive (Akopian et al., 2024; Basuki et al., 2022; Narne et al., 2024). In developing countries, the promise of digital governance is particularly compelling because it carries the potential to overcome longstanding barriers of bureaucratic inefficiency, corruption, and administrative opacity (Nambassa & Nurmandi, 2024; Omweri, 2024; Udoh, 2024).

The implementation of digital systems in such contexts is rarely smooth. It involves negotiating infrastructural limitations, uneven digital literacy, institutional inertia, and political complexities that shape the everyday practice of governance. Indonesia provides a vivid illustration of this reality. As one of the largest democracies in the world, Indonesia has embarked on an ambitious journey toward digital reform under its Smart City and e-Government initiatives. These programs seek to harness technology to promote transparency, efficiency, and inclusivity in public service.

Despite considerable progress, the outcomes have been uneven across regions, revealing persistent gaps between technological design and administrative capacity (Trajkovski, 2024; Eze et al., 2024; Das, 2024). Within this national landscape, Makassar City stands out as a pioneering yet paradoxical case. It has been widely recognized for its innovation through the Smart Governance Program, a flagship initiative that integrates information and communication technologies into the delivery of municipal services and decision-making processes. The city's slogan, Makassar Sombere dan Smart City, reflects an ambition to blend technological progress with local wisdom, embedding modern governance within a culturally resonant ethos of empathy and cooperation. However, beneath this narrative of success lies a complex reality.

While digital platforms have expanded citizen access to public services and improved administrative visibility, questions remain about the depth of institutional integration, the inclusiveness of participation, and the sustainability of digital trust. The Smart Governance Program thus provides an invaluable opportunity to explore how digital ideals are translated into administrative and social practice within a dynamic urban context (Przeybilovicz & Cunha, 2024; Nastjuk et al., 2022; Demirel & Mülazımoğlu, 2022). The concept of digital governance itself implies more than technological adoption. It entails the transformation of governance philosophy, institutional design, and civic behavior.

Scholars such as Wu et al. (2015), have argued that the effectiveness of digital governance depends on how well technology aligns with organizational structures and cultural realities. When systems are introduced into bureaucracies without adequate adaptation, they often reproduce rather than reform existing inefficiencies a phenomenon known as the "design reality gap." In Indonesia's context, where bureaucratic traditions remain deeply embedded, this gap can manifest in fragmented infrastructure, uneven inter-departmental coordination, and limited responsiveness to public input.

Examining Makassar's experience becomes crucial not only for assessing technological readiness but also for understanding the institutional and cultural processes that shape governance transformation (Setiawan et al., 2024; Suyuthi et al., 2023; Aslam et al., 2024). Equally important is the question of citizen engagement in digital governance. The shift toward online service delivery redefines the citizen's role from a passive recipient to an active participant in the governance process.

Yet participation in the digital sphere is stratified by access, literacy, and trust. Studies have shown that while digital platforms can enhance communication and feedback mechanisms, they do not automatically guarantee democratic accountability. In Makassar, public participation through complaint systems and service applications represents an important step toward interactive governance, but the responsiveness of these systems determines whether participation translates into empowerment or frustration. Understanding how citizens experience and perceive these platforms offers insight into the relational dynamics between government and society in the digital age (Janowski et al., 2018; Lips, 2010).

Despite the growing body of research on e-governance and smart cities, there remains a gap in understanding how digital governance operates in local contexts marked by hybrid bureaucratic systems and diverse social structures. Much of the existing scholarship focuses on policy design and technological innovation, but fewer studies interrogate the lived realities of implementation

how policies are interpreted by local bureaucrats, how digital systems interact with institutional cultures, and how citizens navigate these evolving interfaces. This study addresses that gap by evaluating the implementation and effectiveness of the Smart Governance Program in Makassar City through a qualitative and interpretative lens.

Rather than measuring success through numerical indicators, it seeks to understand how the program's underlying principles transparency, efficiency, accountability, and participation are realized, negotiated, or constrained in practice. The significance of this research extends beyond Makassar. It offers broader reflections on how cities in the Global South are localizing digital governance within their administrative and cultural ecologies. By examining both the achievements and the challenges of Smart Governance, this study contributes to the growing discourse on how technology reshapes the ethics and architecture of public administration. It argues that the digital transformation of governance is not merely a technical revolution but a moral and institutional evolution that redefines the relationship between the state and its citizens. Through this lens, Makassar's experience becomes more than a local experiment it becomes a mirror through which the possibilities and paradoxes of digital governance in Indonesia, and indeed in much of the developing world, can be critically observed and reimagined.

METHODOLOGY

This study employed a quantitative research approach to evaluate the implementation and effectiveness of the Smart Governance Program in Makassar City, Indonesia. Quantitative methods were selected because they allow the researcher to systematically measure perceptions, institutional performance, and citizen responses toward digital governance practices through statistical analysis. The approach was designed to examine the relationship between the implementation of smart governance and indicators of public service effectiveness, including transparency, efficiency, accountability, and citizen participation. Quantitative inquiry is appropriate for governance studies because it enables objective measurement of social phenomena and facilitates generalization across broader populations (Sykes et al., 2018; Mohajan, 2020; Lim, 2025). The methodology was developed to provide empirical evidence regarding how digital governance mechanisms influence administrative performance and public engagement in the context of urban governance transformation in Makassar City.

Research Design

The research adopted a descriptive-explanatory survey design. The descriptive dimension was intended to identify the current condition of smart governance implementation in Makassar City, while the explanatory dimension aimed to analyze the influence of digital governance implementation on the effectiveness of public services. Survey-based quantitative designs are widely used in public administration and governance studies because they facilitate the collection of standardized data from large groups of respondents in a relatively efficient manner (Krause et al., 2024; Zhang et al., 2023; Meyer-Sahling et al., 2019). The study applied a cross-sectional design in which data were collected at a single point in time during the implementation phase of the Smart Governance Program in 2025. This design was considered suitable because the study sought to capture respondents' perceptions and experiences regarding the operation of digital governance systems without manipulating the research environment. The conceptual framework of the study positioned smart governance implementation as the independent variable and public service effectiveness as the dependent variable. Indicators of smart governance included digital accessibility, service integration, transparency, responsiveness, and institutional coordination, while public service effectiveness was measured through efficiency, accountability, citizen satisfaction, and participation.

Research Location and Context

The research was conducted in Makassar City, South Sulawesi, Indonesia. Makassar was selected as the research location because it is recognized as one of the pioneering cities implementing the Smart City initiative in Indonesia through the Smart Governance Program. The city has introduced various digital governance platforms, including online public service systems, complaint management applications, electronic administration systems, and integrated information services intended to improve bureaucratic performance and citizen engagement.

Makassar represents a strategic urban context for studying digital governance because it combines rapid technological development with complex administrative and social dynamics. The Smart Governance Program in Makassar emphasizes transparency, service efficiency, participatory governance, and digital transformation within public administration. Nevertheless, the coexistence of conventional bureaucratic systems and digital service mechanisms creates institutional challenges related to adaptation, coordination, and public trust. These conditions make Makassar an appropriate case for evaluating the practical implementation and effectiveness of digital governance in a developing urban environment.

Population and Sample

The population of this study consisted of citizens and government employees who interacted directly with the Smart Governance Program in Makassar City. The target population included users of online public service applications, civil servants involved in digital administration, and residents who had experience accessing digital government services. Because the total population of digital governance users in Makassar could not be identified precisely, the study utilized a purposive sampling technique combined with proportional sampling criteria. Purposive sampling was employed to ensure that respondents possessed relevant experience and knowledge regarding the implementation of smart governance systems. Respondents were selected based on several criteria: (1) individuals who had used digital public services at least twice within the last year, (2) government employees involved in digital administrative processes, and (3) citizens aged eighteen years or older residing in Makassar City. The sample size consisted of 200 respondents. This number was considered adequate for quantitative statistical analysis and reflected recommendations for social science survey research, which suggest that samples exceeding 100 respondents are sufficient for regression and correlational analysis. The distribution of respondents included government officials, administrative staff, students, entrepreneurs, and general citizens who interacted with digital governance platforms.

Data Collection Techniques

Data collection was conducted using structured questionnaires distributed both online and offline. The questionnaire was developed based on indicators derived from digital governance and public administration literature, particularly dimensions related to transparency, efficiency, accountability, responsiveness, and citizen participation. The instrument employed a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Likert-scale measurement was selected because it enables the quantification of perceptions and attitudes toward governance performance in a consistent and measurable manner (Sekaran & Bougie, 2016). The questionnaire consisted of two main sections. The first section collected demographic information such as age, occupation, education level, and frequency of digital service usage. The second section measured perceptions regarding the implementation and effectiveness of smart governance. To complement the survey data, documentation techniques were also employed. Official government reports, smart city policy documents, digital service statistics, and administrative publications were reviewed to provide contextual understanding of the Smart Governance Program in Makassar City. Documentation served as supporting evidence for interpreting the quantitative findings and strengthening the credibility of the research. Prior to the full-scale survey, a pilot test was conducted involving 30 respondents to assess the clarity, consistency, and reliability of the questionnaire items. Feedback from the pilot study was used to revise ambiguous questions and improve the overall quality of the research instrument.

Data Analysis Techniques

The collected data were analyzed using descriptive and inferential statistical methods with the assistance of Statistical Package for the Social Sciences (SPSS). Descriptive statistics were used to present respondent characteristics and summarize the distribution of responses regarding smart governance implementation and public service effectiveness. Mean scores, percentages, and standard deviations were calculated to identify trends and patterns in respondent perceptions. Inferential statistical analysis was conducted to examine the relationship between variables. Pearson correlation analysis was used to determine the strength and direction of the relationship between smart governance implementation and public service effectiveness. Multiple linear

regression analysis was subsequently applied to identify the extent to which dimensions of digital governance influenced governance effectiveness indicators. Regression analysis is commonly utilized in quantitative governance studies because it allows researchers to estimate predictive relationships among variables (Bernerth et al., 2018; Purwanto & Sudargini, 2021; Combs et al., 2019).

The statistical model used in this study can be expressed as follows:

$Y=a+b_1X_1+b_2X_2+b_3X_3+e$

(Y) = Public Service Effectiveness

(a) = Constant

(b) = Regression Coefficient

(X1) = Transparency

(X2) = Responsiveness

(X3) = Digital Accessibility

(e) = Error Term

The level of statistical significance applied in this study was 0.05. Results with significance values below 0.05 were interpreted as statistically significant relationships.

Validity and Reliability

Instrument validity and reliability were carefully examined to ensure the quality and consistency of the research findings. Content validity was established through expert review involving academics in public administration and digital governance studies. Their evaluations ensured that the questionnaire items adequately represented the conceptual dimensions of smart governance and public service effectiveness. Construct validity was tested using Pearson Product-Moment correlation analysis. Questionnaire items were considered valid when the correlation coefficient exceeded the minimum threshold value of 0.30. Reliability testing was conducted using Cronbach's Alpha coefficient. Reliability coefficients above 0.70 indicate acceptable internal consistency. The results of the reliability test demonstrated that all research variables achieved Cronbach's Alpha values exceeding the required threshold, indicating that the instrument was reliable for data collection. Methodological triangulation was applied through the use of survey data and documentation analysis to strengthen the credibility of the findings. Ethical considerations were also maintained throughout the research process. Respondents participated voluntarily, and all collected information was treated confidentially and used solely for academic purposes.

Table 1. Research Variables and Indicators

Variable	Indicators	Source
Smart Governance Implementation	Transparency, responsiveness, digital accessibility, institutional coordination, service integration	Janowski et al. (2018); Webster & Leleux (2018)
Public Service Effectiveness	Efficiency, accountability, citizen satisfaction, participation	Tomor et al. (2019); Petrakaki (2018)

The operational framework used to measure the principal variables in this study. The variable of Smart Governance Implementation was operationalized through five indicators, namely transparency, responsiveness, digital accessibility, institutional coordination, and service integration. These indicators reflect the essential dimensions of digital governance within contemporary public administration, particularly in the context of smart city development. Transparency emphasizes the accessibility of public information and openness of administrative processes, while responsiveness refers to the ability of government institutions to respond efficiently to citizen needs and complaints. Digital accessibility measures the extent to which citizens can easily access and utilize digital public services. Institutional coordination and service

integration represent the government's capacity to synchronize digital systems across administrative sectors in order to improve efficiency and policy implementation.

The variable of Public Service Effectiveness was measured through indicators of efficiency, accountability, citizen satisfaction, and public participation. These dimensions were selected because they represent the primary objectives of digital governance reform in enhancing the quality of public administration. Efficiency relates to the reduction of bureaucratic complexity and service delays, accountability reflects administrative responsibility and procedural transparency, citizen satisfaction measures public perceptions toward service quality, and participation evaluates the extent of citizen involvement in governance processes. The use of these indicators enabled the study to quantitatively examine how smart governance practices influence the effectiveness of public services in Makassar City. The indicators were adapted from previous studies in digital governance and public administration literature to ensure conceptual relevance and measurement validity.

RESULTS AND DISCUSSION

This section presents the empirical findings of the study concerning the implementation and effectiveness of the Smart Governance Program in Makassar City. The results are organized systematically based on the quantitative procedures described in the methodology section, including descriptive statistics, validity and reliability testing, Pearson correlation analysis, and multiple linear regression analysis. The presentation of findings aims to explain how dimensions of smart governance particularly transparency, responsiveness, and digital accessibility affect public service effectiveness in the context of digital governance implementation. The findings are derived from questionnaires distributed to 200 respondents consisting of government employees, students, entrepreneurs, administrative staff, and citizens who actively interacted with digital public services in Makassar City. Data analysis was conducted using SPSS to ensure statistical consistency and accuracy. The results demonstrate not only the level of public perception regarding smart governance implementation but also the statistical relationship between digital governance dimensions and governance effectiveness indicators such as efficiency, accountability, citizen satisfaction, and participation.

Respondent Characteristics

The demographic distribution of respondents provides an overview of the social composition of participants involved in this study. Understanding respondent characteristics is important because the implementation of digital governance is closely related to digital literacy, access to technology, and frequency of interaction with public service platforms. Table 2 shows the demographic profile of respondents based on gender, occupation, age, and frequency of digital service usage.

Table 2. Demographic Characteristics of Respondents

Characteristics	Category	Frequency	Percentage
Gender	Male	108	54%
	Female	92	46%
Age	18–25 years	74	37%
	26–35 years	69	34.5%
	36–45 years	38	19%
	>45 years	19	9.5%
Occupation	Government Employees	51	25.5%
	Students	48	24%
	Entrepreneurs	36	18%
	Administrative Staff	31	15.5%
	General Citizens	34	17%
Frequency of Digital Service Usage	Frequently	119	59.5%
	Occasionally	63	31.5%
	Rarely	18	9%

Source: Processed Survey Data, 2025.

Male respondents slightly dominated the sample population, accounting for 54% of participants. Respondents aged between 18 and 35 years represented the largest proportion of users of digital governance services, suggesting that younger citizens are more actively engaged with digital administrative platforms. Government employees and students formed significant respondent groups because both categories frequently interact with online administrative systems.

The findings also reveal that 59.5% of respondents frequently used digital public services, indicating relatively high exposure to the Smart Governance Program. This result suggests that digital governance platforms in Makassar City have become increasingly integrated into daily administrative interactions. Nevertheless, the presence of respondents who rarely used digital services indicates that barriers to accessibility and adaptation remain evident within certain segments of society.

Descriptive Analysis of Smart Governance Implementation

Descriptive statistical analysis was conducted to measure respondent perceptions regarding the implementation of smart governance dimensions, including transparency, responsiveness, and digital accessibility. Mean scores and standard deviations were calculated to determine the general tendency of respondent evaluations.

Table 3. Descriptive Statistics of Smart Governance Variables

Variable	Mean	Standard Deviation	Category
Transparency	4.08	0.63	High
Responsiveness	3.94	0.71	High
Digital Accessibility	3.87	0.76	High
Public Service Effectiveness	4.01	0.68	High

Source: Processed Survey Data, 2025.

All research variables achieved mean scores above 3.80, indicating positive public perceptions regarding the implementation of digital governance in Makassar City. Transparency obtained the highest mean value (4.08), suggesting that respondents perceived digital platforms as capable of improving access to public information and reducing bureaucratic opacity. Online administrative systems were considered effective in facilitating public access to government procedures, service information, and complaint mechanisms.

Responsiveness also achieved a relatively high score (3.94), indicating that respondents generally viewed digital governance systems as capable of accelerating administrative responses and improving communication between government institutions and citizens. However, several respondents still reported delays in complaint handling and inconsistent responses across government agencies. This finding suggests that institutional coordination remains a challenge despite technological improvements.

Digital accessibility recorded the lowest mean score among the independent variables (3.87). Although categorized as high, this result indicates that accessibility remains uneven across user groups. Respondents noted that some digital services required stable internet connectivity and technological literacy that were not equally available among all citizens. The persistence of accessibility disparities reflects broader infrastructural and socio-economic inequalities influencing digital governance implementation.

Public service effectiveness achieved a mean score of 4.01, suggesting that respondents generally perceived the Smart Governance Program as contributing positively to service efficiency, accountability, and citizen participation. The findings indicate that digital governance has improved administrative visibility and reduced procedural complexity in several government services.

Validity and Reliability Testing

Instrument testing was conducted to ensure that the questionnaire accurately measured the intended research variables. Validity testing employed Pearson Product-Moment correlation analysis, while reliability testing utilized Cronbach's Alpha coefficients.

Table 4. Validity and Reliability Test Results

Variable	Validity Coefficient Range	Cronbach's Alpha	Interpretation
Transparency	0.511–0.784	0.842	Reliable
Responsiveness	0.498–0.801	0.856	Reliable
Digital Accessibility	0.534–0.792	0.819	Reliable
Public Service Effectiveness	0.563–0.826	0.874	Reliable

Source: SPSS Output, 2025.

Questionnaire items exceeded the minimum validity threshold of 0.30, indicating that each indicator was statistically valid for measuring the intended constructs. Reliability coefficients also exceeded the recommended Cronbach's Alpha threshold of 0.70, confirming that the research instrument possessed strong internal consistency. The highest reliability coefficient was identified in the public service effectiveness variable (0.874), indicating that respondents provided relatively stable and consistent evaluations regarding administrative effectiveness. These findings confirm that the instrument was suitable for inferential statistical analysis and hypothesis testing.

Correlation Analysis

Pearson correlation analysis was conducted to identify the relationship between smart governance implementation variables and public service effectiveness. Correlation coefficients were interpreted based on the strength and direction of relationships among variables.

Table 5. Pearson Correlation Analysis

Variables	Transparency	Responsiveness	Digital Accessibility	Public Service Effectiveness
Transparency	1.000	0.682	0.644	0.781
Responsiveness	0.682	1.000	0.617	0.754
Digital Accessibility	0.644	0.617	1.000	0.702
Public Service Effectiveness	0.781	0.754	0.702	1.000

Source: SPSS Output, 2025.

The correlation results indicate strong positive relationships between all smart governance dimensions and public service effectiveness. Transparency demonstrated the strongest correlation with public service effectiveness ($r = 0.781$), suggesting that increased openness and accessibility of information significantly influence citizen perceptions regarding administrative quality. Responsiveness also showed a strong relationship with governance effectiveness ($r = 0.754$). This finding indicates that citizens value rapid administrative responses and effective communication channels within digital governance systems. Efficient complaint management and service responsiveness contribute substantially to public trust and satisfaction.

Digital accessibility achieved a positive correlation coefficient of 0.702, indicating that accessible digital systems significantly affect service effectiveness. Nevertheless, the comparatively lower correlation coefficient suggests that technological accessibility alone is insufficient without institutional responsiveness and transparent governance practices. The correlation analysis confirms that smart governance implementation contributes positively to improving public service effectiveness in Makassar City.

Multiple Linear Regression Analysis

Multiple regression analysis was conducted to examine the simultaneous influence of transparency, responsiveness, and digital accessibility on public service effectiveness.

The regression equation applied in this study was:

$$Y = a + b1X1 + b2X2 + b3X3 + e$$

Table 6. Multiple Linear Regression Results

Variable	Regression Coefficient (B)	t-value	Significance
Constant	1.214	3.108	0.002
Transparency	0.391	6.824	0.000
Responsiveness	0.347	5.992	0.000
Digital Accessibility	0.281	4.781	0.001

Source: SPSS Output, 2025.

The results of the multiple linear regression analysis examining the influence of transparency, responsiveness, and digital accessibility on public service effectiveness within the Smart Governance Program in Makassar City. The findings demonstrate that all independent variables exerted positive and statistically significant effects on public service effectiveness, as indicated by significance values below the 0.05 threshold. These results confirm that the implementation of smart governance dimensions contributes substantially to improving administrative performance and citizen-oriented public services. Among the independent variables, transparency produced the highest regression coefficient value (B = 0.391), indicating that transparency was the strongest predictor of public service effectiveness. This finding suggests that accessible public information, open administrative procedures, and transparent governance systems significantly enhance public trust, accountability, and administrative efficiency. Citizens tend to perceive digital governance more positively when government institutions provide clear and accessible information regarding services, procedures, and decision-making processes.

Responsiveness also demonstrated a significant positive influence on public service effectiveness with a regression coefficient of 0.347. This result indicates that the ability of government institutions to respond quickly to citizen complaints, service requests, and administrative issues plays an important role in strengthening the effectiveness of digital governance. Faster communication and timely administrative responses contribute to higher levels of citizen satisfaction and improve perceptions regarding bureaucratic performance. Digital accessibility obtained a regression coefficient of 0.281 and remained statistically significant at the 0.001 level. Although its influence was comparatively lower than transparency and responsiveness, digital accessibility still represented an important factor affecting governance effectiveness. This finding indicates that the availability of accessible digital platforms, user-friendly interfaces, and adequate technological infrastructure significantly support the implementation of smart governance systems. The relatively lower coefficient also suggests that accessibility alone is insufficient without institutional responsiveness and transparent administrative practices.

The constant value of 1.214 indicates that even without the influence of the independent variables, public service effectiveness maintains a baseline value influenced by other external factors not included in the regression model. These factors may include organizational culture, bureaucratic leadership, technological literacy, and policy implementation capacity. The regression analysis confirms that the effectiveness of smart governance in Makassar City depends not only on technological innovation but also on institutional quality, administrative openness, and the responsiveness of public sector organizations toward citizen needs.

Table 7. Model Summary of Multiple Linear Regression Analysis on Smart Governance Implementation and Public Service Effectiveness

Model Summary	Value
R	0.842
R Square	0.709
Adjusted R Square	0.704
F-value	158.637
Significance	0.000

Source: SPSS Output, 2025.

The regression analysis demonstrates that all independent variables significantly influenced public service effectiveness because all significance values were below the 0.05 threshold. Transparency emerged as the most influential variable with a regression coefficient of 0.391, indicating that improvements in information openness and administrative transparency substantially enhance governance effectiveness. Responsiveness also exerted a significant positive effect on service effectiveness with a coefficient value of 0.347. This finding suggests that efficient communication and rapid administrative responses play a crucial role in shaping citizen satisfaction and trust toward digital governance systems.

Digital accessibility demonstrated a statistically significant influence with a regression coefficient of 0.281. Although its contribution was relatively smaller than transparency and responsiveness, accessibility remained an important determinant of governance effectiveness because digital services cannot function optimally without adequate public access. The model summary indicates an R Square value of 0.709, meaning that 70.9% of the variation in public service effectiveness can be explained by transparency, responsiveness, and digital accessibility simultaneously. The remaining 29.1% may be influenced by other factors not included in this study, such as bureaucratic culture, institutional leadership, digital literacy, and infrastructural disparities.

The F-test significance value of 0.000 confirms that the regression model is statistically significant and suitable for explaining the relationship between smart governance implementation and public service effectiveness. The quantitative findings indicate that the Smart Governance Program in Makassar City has contributed positively to improving administrative effectiveness, transparency, and citizen participation. Digital governance platforms have facilitated easier access to information, accelerated bureaucratic responsiveness, and strengthened public interaction with government institutions. However, the findings also reveal persistent challenges related to digital accessibility and institutional adaptation.

Transparency emerged as the strongest determinant of governance effectiveness, indicating that citizens highly value open administrative systems and accessible information. Responsiveness also plays a central role in strengthening public trust, while digital accessibility remains essential for ensuring inclusiveness within digital governance systems. The results confirm that successful smart governance implementation depends not only on technological infrastructure but also on institutional responsiveness, administrative transparency, and the capacity of government institutions to maintain citizen-centered digital services.

Table 8. Respondent Perceptions of Smart Governance Service Quality

Indicator	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Digital services increase administrative transparency	41%	46%	9%	3%	1%
Online systems accelerate public service delivery	38%	44%	12%	5%	1%
Government agencies respond quickly to complaints	33%	47%	14%	5%	1%
Digital platforms are easy to access and operate	29%	48%	16%	6%	1%
Smart governance improves citizen participation	35%	45%	13%	6%	1%

Source: Processed Survey Data, 2025.

The majority of respondents expressed positive perceptions toward the implementation of digital governance services in Makassar City. The highest agreement level appeared in the indicator related to administrative transparency, where 87% of respondents either agreed or strongly agreed that digital platforms improved access to public information. The findings also indicate that online systems contributed to faster service delivery and strengthened interaction between citizens and government institutions. Nevertheless, a moderate proportion of respondents

remained neutral regarding accessibility and complaint responsiveness, suggesting that certain administrative and infrastructural challenges continue to affect the consistency of smart governance implementation.

Table 9. Public Service Effectiveness Indicators

Effectiveness Indicator	Mean Score	Standard Deviation	Interpretation
Service Efficiency	4.12	0.61	High
Administrative Accountability	4.05	0.67	High
Citizen Satisfaction	3.96	0.73	High
Public Participation	3.91	0.75	High

Source: Processed Survey Data, 2025.

Service efficiency obtained the highest mean score among effectiveness indicators, indicating that digital governance systems successfully reduced procedural complexity and administrative delays. Administrative accountability also achieved a strong evaluation because respondents perceived digital systems as improving documentation and procedural transparency. Citizen satisfaction and public participation recorded relatively lower mean scores compared to efficiency, suggesting that although technological innovation has improved governance performance, meaningful participation and inclusive engagement still require further institutional strengthening.

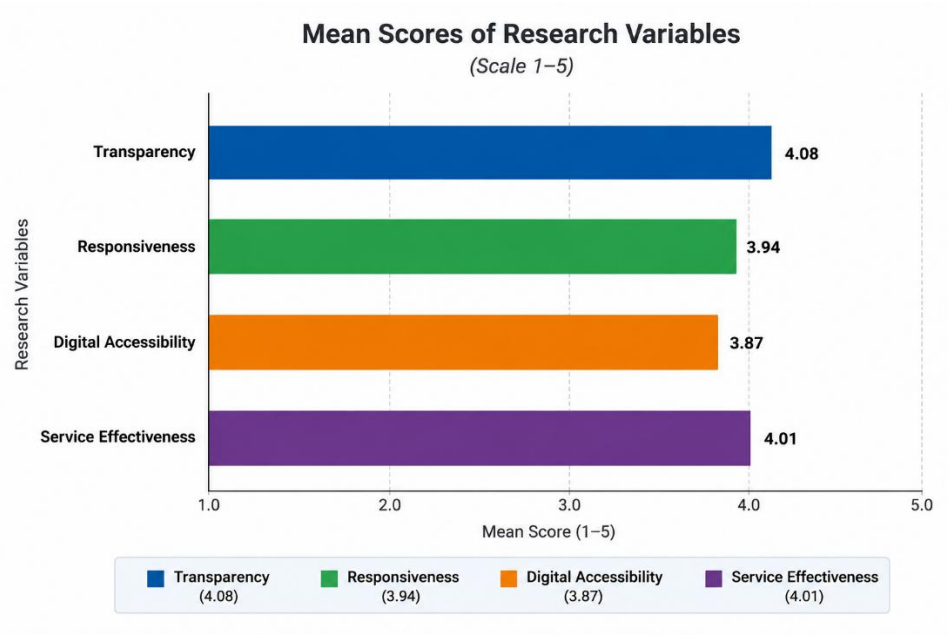

Figure 1. Distribution of Respondent Evaluations toward Smart Governance Implementation

The comparative distribution of mean scores across the principal research variables. Transparency achieved the highest evaluation, reinforcing the finding that openness of information and visibility of administrative processes constitute the strongest dimension of smart governance implementation in Makassar City. Digital accessibility obtained the lowest mean score among the variables, indicating that technological access and user adaptation remain relatively weaker dimensions within the digital governance ecosystem.

Table 10. Summary of Hypothesis Testing

Hypothesis	Statement	Result	Decision
H1	Transparency positively influences public service effectiveness	Sig. = 0.000	Accepted
H2	Responsiveness positively influences public service effectiveness	Sig. = 0.000	Accepted

H3	Digital accessibility positively influences public service effectiveness	Sig. = 0.001	Accepted

Source: SPSS Output, 2025.

All proposed hypotheses were statistically supported. Each independent variable demonstrated a significant positive influence on public service effectiveness because all significance values were below the 0.05 threshold. The findings indicate that successful smart governance implementation depends on the integration of transparent administrative systems, responsive public services, and accessible digital infrastructure.

Discussion

Smart Governance Implementation in Improving Public Service Effectiveness

The findings of this study demonstrate that the implementation of smart governance in Makassar City has significantly contributed to improving the effectiveness of public services. The descriptive statistical analysis revealed that transparency, responsiveness, and digital accessibility all achieved high mean scores, indicating positive public perceptions toward the Smart Governance Program. Transparency emerged as the strongest dimension with a mean score of 4.08 and the highest regression coefficient (B = 0.391), suggesting that openness of information and administrative visibility play a dominant role in shaping perceptions of governance effectiveness. These findings indicate that citizens increasingly value digital systems that provide accessible information, transparent procedures, and clear communication channels within public administration.

The significant influence of transparency reflects the changing relationship between citizens and government institutions in the digital era. Digital governance systems in Makassar City appear to reduce bureaucratic opacity by enabling citizens to monitor procedures, access service information, and submit complaints through online platforms. This finding aligns with Janowski et al. (2018), who argue that digital governance reshapes citizen-administration relationships by promoting institutional openness and participatory interaction. Transparent administrative systems strengthen public trust because citizens perceive government processes as more accountable and less vulnerable to procedural manipulation. The strong correlation coefficient between transparency and public service effectiveness (r = 0.781) further confirms that transparency functions not merely as a technological feature but as an institutional mechanism that improves governance legitimacy.

Responsiveness also demonstrated a substantial influence on public service effectiveness, both in the correlation analysis (r = 0.754) and regression analysis (B = 0.347). These findings indicate that citizens prioritize rapid administrative responses and effective communication within digital governance systems. The implementation of complaint management applications and online administrative services in Makassar City appears to facilitate quicker interactions between government agencies and service users. Faster response mechanisms contribute to perceptions of administrative efficiency and strengthen citizen satisfaction with public services (Dakarai et al., 2023; Nie & Wang, 2023; Chan et al., 2021; Manaf et al., 2023). This result supports the argument proposed by Webster & Leleux (2018) that technologically mediated governance enhances co-production between government and society by improving communication responsiveness and citizen engagement.

Despite these positive developments, the findings also reveal persistent institutional challenges within smart governance implementation. Several respondents indicated inconsistencies in complaint handling and differences in service responsiveness across government institutions. These findings suggest that technological transformation alone cannot fully eliminate bureaucratic fragmentation. Institutional coordination and administrative adaptation remain necessary to ensure that digital governance systems operate consistently across public sector organizations. The coexistence of manual administrative procedures and digital platforms reflects a transitional governance structure in which technological innovation develops more rapidly than bureaucratic reform. This condition supports Wu et al. (2015), who emphasize that digital

governance effectiveness depends on the alignment between technological systems and organizational structures.

Digital accessibility achieved the lowest mean score among the independent variables, although it remained statistically significant in influencing governance effectiveness. The relatively lower regression coefficient (B = 0.281) indicates that accessibility contributes positively to governance performance but remains constrained by infrastructural and social disparities. Respondents acknowledged that digital public services improved administrative convenience, yet some users continued to experience difficulties related to internet connectivity, technological literacy, and system usability. These findings suggest that the implementation of digital governance in Makassar City has not fully eliminated inequalities in access to public services.

The issue of accessibility reflects broader structural challenges commonly experienced in digital governance implementation within developing urban contexts (Przeybilovicz & Cunha, 2024; Pereira et al., 2018). Citizens with stronger technological literacy and stable internet access are more capable of utilizing digital services effectively, while socially and economically marginalized groups may experience exclusion from online administrative systems. This finding supports the perspective of Lips (2010), who argues that digital identity and technological governance can simultaneously enhance participation while creating new forms of exclusion if accessibility disparities are not adequately addressed. Consequently, digital transformation in public administration requires not only technological infrastructure but also inclusive governance strategies capable of accommodating diverse citizen capacities.

The results concerning public service effectiveness further strengthen the argument that smart governance contributes positively to administrative reform in Makassar City. Service efficiency obtained the highest mean score among effectiveness indicators (4.12), indicating that digital governance systems successfully reduced procedural complexity and administrative delays. Citizens perceived online administrative systems as more efficient compared to conventional bureaucratic processes because digital services simplified document processing, complaint submission, and information access. Accountability also achieved a high evaluation, suggesting that digital systems improved procedural documentation and administrative transparency.

Citizen participation and satisfaction, however, recorded comparatively lower scores than efficiency and accountability. This finding indicates that although digital governance has improved administrative functionality, meaningful citizen engagement remains limited. Participation mechanisms within digital platforms may still function primarily as communication tools rather than substantive instruments for collaborative governance. Citizens can submit feedback and complaints through online systems, but their involvement in policy formulation and decision-making processes remains relatively restricted. This condition reflects the distinction between procedural participation and deliberative participation within digital governance frameworks. Technological platforms may facilitate communication, yet deeper democratic engagement requires institutional willingness to integrate citizen input into governance processes.

The model summary analysis demonstrated an R Square value of 0.709, indicating that transparency, responsiveness, and digital accessibility collectively explained 70.9% of the variation in public service effectiveness. This result confirms that smart governance dimensions exert a substantial influence on governance performance in Makassar City. Nevertheless, the remaining 29.1% suggests that other factors beyond technological governance also affect administrative effectiveness. Organizational culture, leadership quality, bureaucratic professionalism, and policy implementation capacity likely contribute significantly to governance outcomes. Digital governance therefore should not be interpreted solely as technological modernization but as part of broader institutional transformation within public administration.

Institutional and Societal Implications of Smart Governance in Makassar City

The findings of this study indicate that the Smart Governance Program in Makassar City represents both administrative progress and institutional adaptation within Indonesia's evolving digital governance landscape. The positive evaluations toward transparency, responsiveness, and efficiency demonstrate that digital governance systems have begun to reshape how citizens

interact with government institutions. Public services are increasingly perceived as faster, more transparent, and more accessible compared to conventional administrative mechanisms (Ilawagbon & Ajisebiyawo, 2024; Pavel & Nikita, 2025; Jashari & Pepaj, 2018). This transformation reflects the broader transition from traditional bureaucratic governance toward digitally mediated public administration.

The implementation of smart governance in Makassar City also reflects the growing institutional recognition that public administration must adapt to technological change and citizen expectations. Citizens increasingly demand administrative systems that are transparent, responsive, and capable of providing services efficiently through digital platforms. Government institutions that fail to adapt to these expectations risk declining public trust and administrative legitimacy. The strong statistical influence of transparency and responsiveness in this study demonstrates that technological governance is closely associated with relational governance, where public trust depends not only on administrative outcomes but also on the quality of interaction between government institutions and citizens.

Institutional trust emerges as a central implication of the study findings. Citizens tend to perceive governance systems positively when digital services facilitate openness, accountability, and responsive communication. Digital governance therefore functions not merely as a technical instrument but also as a mechanism for strengthening institutional credibility. Public trust is reinforced when citizens feel that government institutions are accessible, communicative, and accountable through digital platforms. This finding supports the argument proposed by Petrakaki (2018) that electronic governance restructures accountability by transforming how public sector institutions interact with society.

At the same time, the findings suggest that digital governance implementation remains vulnerable to institutional inconsistencies and infrastructural inequalities. Differences in administrative responsiveness across agencies indicate that technological integration has not yet been accompanied by uniform organizational adaptation (Hasgall & Ahituv, 2018; Seppänen et al., 2025). Certain government institutions appear more capable of implementing digital systems effectively, while others continue to experience bureaucratic rigidity and coordination challenges. Such disparities may weaken citizen confidence because inconsistent service quality reduces perceptions of administrative reliability.

The issue of digital accessibility also carries important social implications. Although digital platforms improve administrative efficiency, unequal technological access may reproduce social inequalities within governance participation. Citizens who possess digital literacy and technological resources benefit more substantially from online services, while marginalized populations remain vulnerable to exclusion. This condition indicates that digital governance cannot be separated from broader socio-economic realities affecting technological access and civic participation. Inclusive governance therefore requires policies that expand internet infrastructure, improve digital literacy, and simplify technological interfaces to ensure equal participation opportunities for all citizens.

The acceptance of all research hypotheses confirms that smart governance dimensions positively influence public service effectiveness (Al-Obthani & Ameen, 2019; Alajmi et al., 2023). The findings also emphasize that technological innovation alone is insufficient to achieve sustainable governance reform. Effective digital governance depends on institutional readiness, organizational coordination, citizen trust, and adaptive administrative culture. The Smart Governance Program in Makassar City demonstrates that successful digital transformation requires the integration of technology with human-centered governance principles emphasizing accountability, inclusiveness, and responsiveness.

These findings contribute to the broader discourse on digital governance in developing urban contexts. Smart governance should not be understood merely as the adoption of technological infrastructure but as an institutional process involving organizational adaptation, citizen engagement, and governance restructuring. Makassar City illustrates how digital governance initiatives can improve administrative performance while simultaneously revealing the complexities of bureaucratic transformation in rapidly developing societies.

CONCLUSION

The implementation of the Smart Governance Program in Makassar City has significantly contributed to improving public service effectiveness through enhanced transparency, responsiveness, and digital accessibility. The quantitative findings revealed that transparency was the most influential factor affecting governance effectiveness, followed by responsiveness and digital accessibility, indicating that citizens highly value open administrative systems, rapid service responses, and accessible digital platforms. The Smart Governance Program has successfully improved administrative efficiency, accountability, and citizen interaction with government institutions by reducing procedural complexity and increasing access to public information. The study also identified several challenges, including unequal digital accessibility, inconsistent responsiveness across institutions, and limitations in citizen participation. These findings suggest that effective digital governance depends not only on technological infrastructure but also on institutional readiness, organizational coordination, and inclusive governance practices capable of strengthening public trust and ensuring citizen-centered public services in the context of urban administrative transformation.

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